REMARKS

The Official Action mailed February 20, 2009, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant appreciates Primary Examiner Elve's time in conducting a personal interview on April 22, 2009. During the interview, the Examiner committed to issuing a further non-final Official Action following the present *Amendment*. Specifically, the Examiner stated that she felt she should more clearly explain her position with respect to the feature that the beam spot of the first laser beam is larger than that of the second laser beam in claim 10, for example. Although the Examiner did not directly comment with respect to claim 1, this claim includes a similar feature concerning overlap of the first and second beams. In the present *Amendment*, the Applicant focuses on the features recited in claims 1 and 10 and explains that the prior art fails to disclose or suggest at least these features. Also, the Applicant has amended apparatus claims 1 and 10 to make clear that the functions previously recited at the end of each claim are clearly part of the means for controlling a shape and a position of a beam spot of second laser beams or a second laser beam (as appropriate to each claim) to overlap with a beam spot of a first laser beam. The Examiner agreed to consider the Applicant's remarks following the submission of this *Amendment*.

The Applicant notes with appreciation the consideration of the Information Disclosure Statements filed on November 26, 2003; January 8, 2004; January 20, 2004; February 3, 2004; September 29, 2005; April 3, 2006; October 19, 2007; and April 9, 2008.

Claims 1, 2, 4-11, 13-20, 22-29, 31-38, 40-47 and 49-54 are pending in the present application, of which claims 1, 10, 19, 28, 37 and 46 are independent. Claims 1 and 10 have been amended to better recite the features of the present invention. For

the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

The Official Action provisionally rejects claims 1, 2, 4-11, 13-20, 22-29, 31-38, 40-47 and 49-54 under the doctrine of obviousness-type double patenting over claims 1-25 of copending U.S. Application Serial No. 10/792,797 to Tanaka. The Applicant respectfully requests that the double patenting rejections be held in abeyance until an indication of allowable subject matter is made in the present application. At such time, the Applicant will respond to any remaining double patenting rejections.

The Official Action rejects claims 1, 2, 4-11 and 13-18 as obvious based on the combination of U.S. Patent No. 6,700,096 or U.S. Publication No. 2003/0136772, both to Yamazaki, and U.S. Patent No. 6,014,401 to Godard. The Official Action rejects claims 19, 20, 22-29, 31-38, 40-47 and 49-54 as obvious based on the combination of Yamazaki, Godard, U.S. Patent No. 6,242,292 to Yamazaki and U.S. Patent No. 7,132,375 to Yamazaki. The Applicant respectfully submits that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present application, as amended.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some reason, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some reason to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the

art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims, as amended.

Independent claim 1 has been amended to clarify that the laser irradiation apparatus comprises, among other features, a plurality of means for controlling a shape and a position of a beam spot of the respective second laser beam to overlap with the beam spot of the first laser beam, each of the plurality of means functioning such that a portion of the beam spot of the first laser beam and an entire portion of the respective beam spots of the second laser beams are overlapped with each other, which is supported in the present specification, for example, by Figure 7 (reproduced below).

Also, independent claims 19 and 37 already recite that a portion of a beam spot of a first laser beam and an entire portion of a plurality of beam spots of second laser beams are overlapped with each other, which is supported in the present specification, for example, by Figure 7.

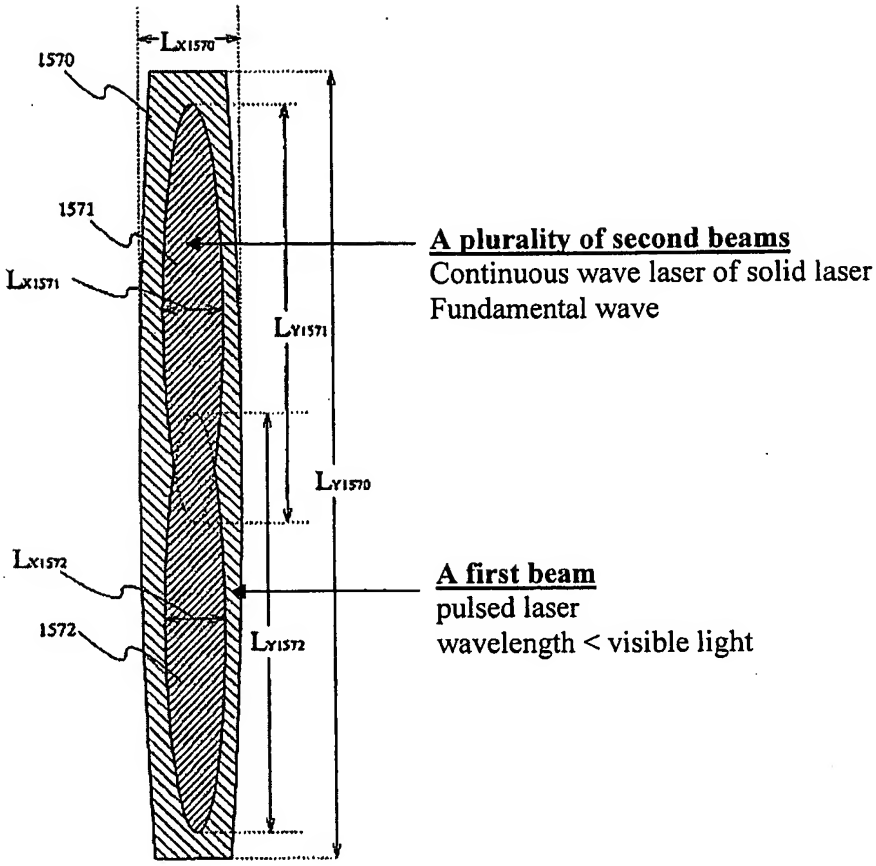
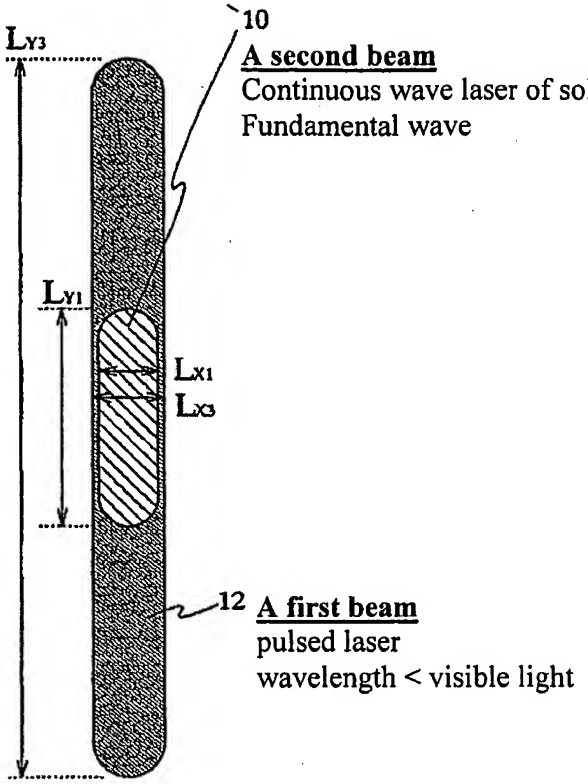


FIG. 7

Independent claim 10 has been amended to clarify that the laser irradiation apparatus comprises, among other features, means for controlling a shape and a position of a beam spot of the second laser beam to overlap with the beam spot of the first laser beam, the means functioning such that the beam spot of the first laser beam is larger than that of the second laser beam, which is supported in the present specification, for example, by Figure 1B (reproduced below).

Also, independent claims 28 and 46 already recite that a beam spot of a first laser beam is larger than that of a second laser beam, which is supported in the present specification, for example, by Figure 1B.

FIG. 1B



The present invention is directed to a laser irradiation apparatus that includes recitation of first and second laser beams having a relationship as shown, for example, in Figure 7. More specifically, a first pulsed laser beam is entirely overlapped with a plurality of second continuous wave laser beams as shown in Figure 7.

The effect of the invention is that a semiconductor material can be melted by the first pulsed laser beam that has a higher relative power and the material can be retained in a molten state by the irradiation of the second continuous wave lasers. This can achieve a larger crystal grain growth during crystallization of the material.

The Official Action fails to address the features of Figure 7. The Applicant has previously filed a *Pre-Appeal Brief Request for Review* and, as a result, prosecution was reopened. However, the new Official Action still fails to address the features above and concerns raised in the *Request*. Godard is newly cited for the teaching of a laser

source having two or more laser units (oscillators), but this is not germane to the concerns noted above.

It is also noted that the Official Action still refers to "absorption coefficients" in connection with claims 19, 20, 22-29, 31-38, 40-47 and 49-54; however, this limitation is not recited in these claims as noted in the *Request*.

For the reasons provided below, Yamazaki '096, '772, '292 and '375 and Godard, either alone or in combination, do not teach or suggest the above-referenced features of the present invention.

In order to anticipate or render obvious the present claims, the prior art must contain an element that performs two functions, i.e. overlapping first and second laser beams so that an entire portion of the beam spots of the second laser beams are overlapped with the beam spot of the first laser beam; or overlapping first and second laser beams so that the beam spot of the first beam is larger than that of the second laser beam. The Applicant respectfully submits that none of the prior art, either alone or in combination, teaches or suggests such an element.

The Official Action asserts that Yamazaki '096 teaches multiple laser beams, however, two laser oscillators are not taught. Yamazaki '096 appears to disclose that a plurality of beam spots are combined so that energy density is flattened as shown in Figures 3A and 3B (reproduced below). According to an engineer at Semiconductor Energy Laboratory Co., Ltd. (the assignee of the present application and each of the Yamazaki patents and applications of record), it is necessary that these beam spots are formed from the same pulsed laser or the same continuous wave laser to obtain the flattened energy density. If beam spots of a pulsed laser and beam spots of a continuous wave laser are combined, then the flattened energy density can not be obtained.

Fig. 3A

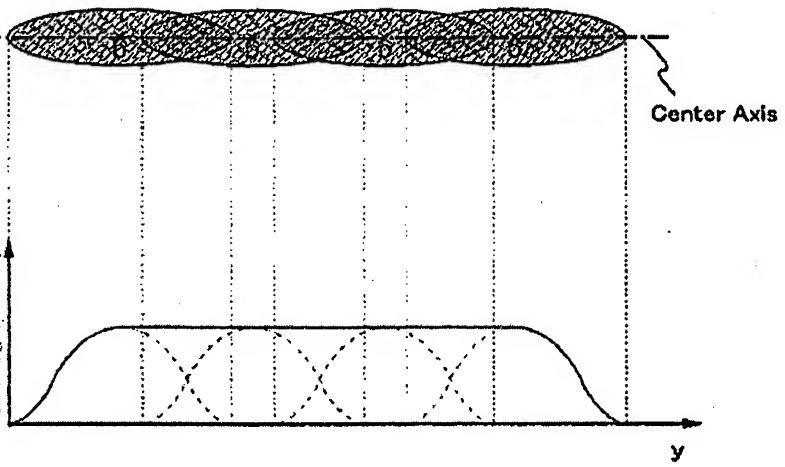


Fig. 3B

In any event, the Applicant respectfully submits that Yamazaki '096 or '772 does not teach or suggest a laser irradiation apparatus having a means for controlling a shape and a position of a beam spot of the respective second laser beam to overlap with the beam spot of the first laser beam, each of the plurality of means functioning such that a portion of the beam spot of the first laser beam and an entire portion of the respective beam spots of the second laser beams are overlapped with each other; or a laser irradiation apparatus having a means for controlling a shape and a position of a beam spot of the second laser beam to overlap with the beam spot of the first laser beam, the means functioning such that the beam spot of the first laser beam is larger than that of the second laser beam.

Godard does not cure the deficiencies in Yamazaki '096. The Official Action asserts that Godard discloses a laser source having two or more laser units (oscillators). The Applicant respectfully disagrees and traverses the assertions in the Official Action. Godard appears to disclose a plurality of excimer laser units LA1, LA2 and LA3; however, Godard does not teach or suggest using a pulsed laser and a continuous wave laser. Also, Godard appears to disclose a plurality of laser beams FLA1, FLA2 and FLA3; however, Godard does not suggest a size of the beam spots or that one should overlap the beam spots.

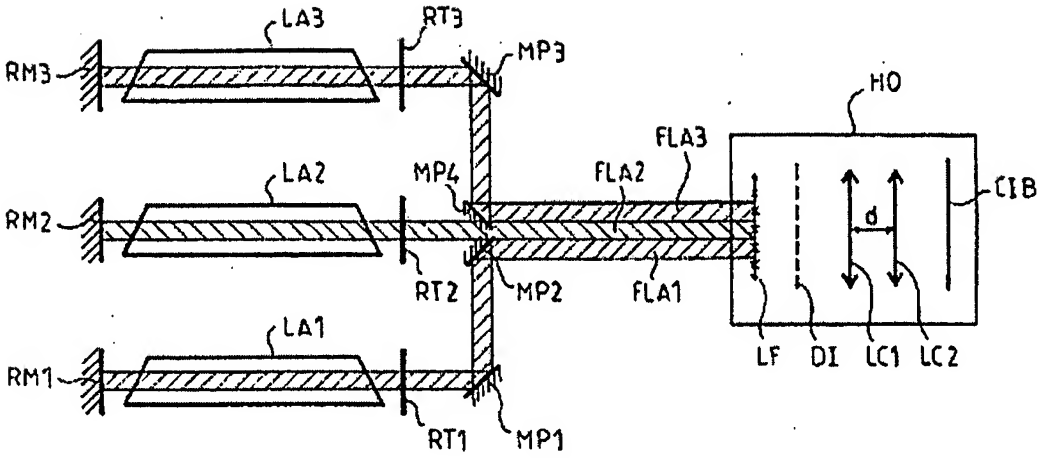


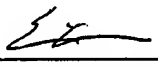
FIG.3

Please incorporate the arguments above with respect to the deficiencies in Yamazaki '096 or '772 and Godard. Yamazaki '292 and '375 do not cure the deficiencies in Yamazaki '096 or '772 and Godard. The Official Action relies on Yamazaki '292 to allegedly teach "absorption specifically with respect to a semiconductor material" (pages 6-7, Paper No. 20090217) and on Yamazaki '375 to allegedly teach "that in the annealing and processing of silicon the absorption coefficient of the amorphous silicon is approximately 10^3 to 10^5/cm" (page 7, Id.). However, Yamazaki '096 or '772, Godard, and Yamazaki '292 and '375, either alone or in combination, do not teach or suggest the following features or that Yamazaki '096 or '772 and Godard should be modified to include any of the above-referenced features of the independent claims of the present invention.

Since Yamazaki '096, '772, '292 and '375 and Godard do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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